0005062994
EC/MPR
I.C.
1992-12
c.1

CONTACTS

B. Miller Contracting Ltd.
P.O. Box 744
Golden, B.C. V0A 1H0
Tel: (604) 344-6289

Mountain Minerals Co. Ltd.
P.O. Box 700, 714 - 5th Avenue S.
Lethbridge, Alberta T1J 3Z6
Tel: (403) 329-0443

B.C. Ministry of Economic Development
Unpublished Studies
712 Yates Street
Victoria, B.C. V8V 1X4
Tel: (604) 387-0238

Ministry of Energy, Mines and Petroleum Resources
Geological Survey Branch
Industrial Minerals Unit
553 Superior St, Victoria, B.C. V8V 1X4
Tel: (604) 356-2846

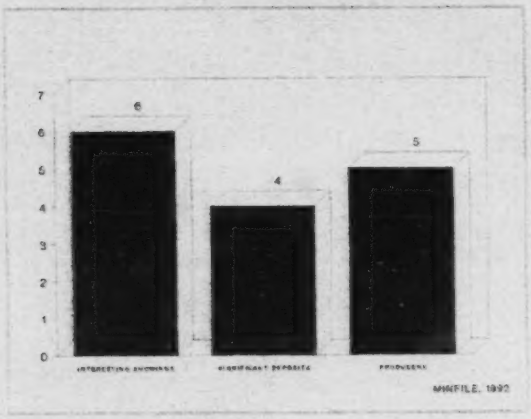
BC

Ministry of Energy, Mines and Petroleum Resources
Geological Survey Branch

SILICON, FERROSILICON AND SILICON CARBIDE

Information Circular 1992-12

DISTRIBUTION OF SILICA OCCURRENCES IN BRITISH COLUMBIA



INVENTORY/RESOURCES

- Silica is the main constituent in the manufacture of silicon, ferrosilicon and silicon carbide.
- Silica occurs primarily as quartzite, vein and pegmatite deposits.
- Quartzite deposits have the best potential for economic development.
- British Columbia has two major quartzite units, the Mount Wilson and Nonda formations, suitable for use in the manufacture of silicon, ferrosilicon and silicon carbide.
  - The Ordovician Mount Wilson quartzite unit extends from Golden to Canal Flats, a distance of more than 150 kilometres.
  - Near Golden, the Mount Wilson quartzite is 300 metres thick and gradually thins to the south. Two producing quartzite deposits grade 99.7% and 99.9% SiO_2.
  - The second unit, the Lower Silurian Nonda quartzite, is exposed 80 kilometres east of Prince George.
  - The Nonda quartzite is up to about 400 metres thick and the SiO_2 content is around 99.5%.
- There are 78 documented, small silica occurrences scattered throughout British Columbia.

PRODUCTION

- British Columbia has a long history of silica production.
- Silica as a flux has been produced from numerous occurrences since the early 1900s.
- Pacific Silica Ltd. started regular shipments of silica from the Gypo deposit near Oliver to Washington and Oregon processors in 1956.
- The Gypo deposit produced close to 600 000 tonnes of silica between 1947 and 1968. This pegmatite deposit is nearly depleted and is being evaluated for underground development.
- The Hunt property, south of Nicholson and operated by B. Miller Contracting Ltd., produces between 30 000 and 50 000 tonnes of silica per year. The silica is shipped to Washington for silicon and ferrosilicon production.
- The Moberly Mountain deposit near Golden, owned by Mountain Minerals Ltd., produces up to 90 000 tonnes per year. It is processed into glass grade, sandblasting, foundry and filtration sand, traction and golf course sand and some lump silica is used in silicon and ferrosilicon manufacturing.
-

RESERVES

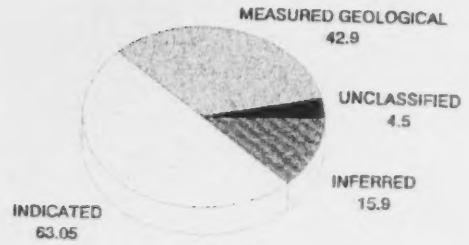
- British Columbia has reserves of 126.25 million tonnes of variable grade silica with virtually an unlimited resource potential (MINFILE, 1992).
- The Moberly Mountain property has reported reserves of 10 million tonnes of friable sandstone, and 50 million tonnes of quartzite (1985).
- Open pittable reserves at the Hunt deposit are estimated at 3 million tonnes (1985).
- Drill core samples from the Koot property, east of Canal Flats, assayed between 97.27 and 99.28% silica (1981).
- The Nonda Quartzite deposit is very pure and homogeneous; assays ranging from 98.84 to 99.8% silica (1985).

MARKETS AND OPPORTUNITIES

- There is no silicon or ferrosilicon production in Western Canada; silicon carbide is not produced in western North America.
- British Columbia has readily available electricity to manufacture these products.
- Ferrosilicon is used in the iron and steel industry for deoxidation of molten metal, as an alloying agent and for reduction of metal oxides in slag.
- Silicon is alloyed with aluminum, copper and nickel and is used by the chemical industry to produce silanes and silicones used as raw materials for other products.
- Very high-purity silicon is used to make semiconductors, photovoltaic cells and microchips for the computer industry.
- Silica, used in the production of silicon and ferrosilicon must be in "lump" form. Typical silica content in silicon and ferrosilicon production is 99.4% minimum.
- Silicon carbide (carborundum) is used as an abrasive, a deoxidizer, a refractory material, and in synthetic ceramics.

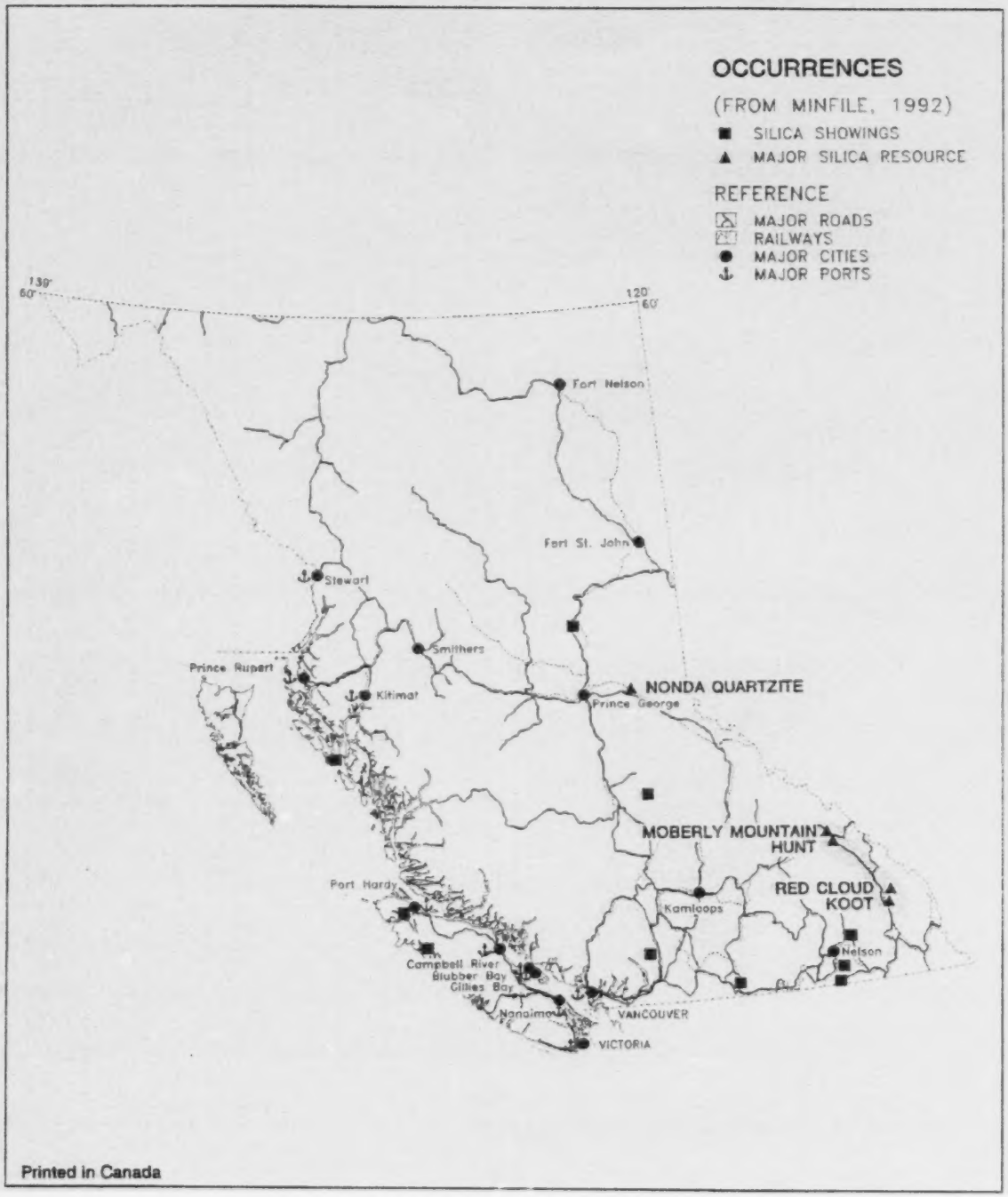
SILICA RESERVES

(Million tonnes - Variable grades)



INFORMATION SOURCES

Foye, G. (1987): Silica Occurrences in British Columbia; *B.C. Ministry of Energy, Mines and Petroleum Resources,* Open File 1987-15.


OCCURRENCES
(FROM MINFILE, 1992)
SILICA SHOWINGS
MAJOR SILICA RESOURCE
REFERENCE
MAJOR ROADS
RAILWAYS
MAJOR CITIES
MAJOR PORTS
139° 60'
120° 60'
Fort Nelson
Fort St. John
Stewart
Smithers
Prince Rupert
Kitimat
NONDA QUARTZITE
Prince George
MOBERLY MOUNTAIN
HUNT
RED CLOUD
KOOT
Port Hardy
Kamloops
Nelson
Campbell River
Blubber Bay
Gilles Bay
Nanaimo
VANCOUVER
VICTORIA
Printed in Canada